

CANADIAN ARCHITECT AND BUILDER.

VOL. VI.—No. IX.

SEPTEMBER, 1893

{ PRICE 20 CENTS
\$2.00 PER YEAR.

—THE— CANADIAN ARCHITECT AND BUILDER,

A Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD),

PUBLISHED ON THE THIRD THURSDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS,
DECORATORS, BUILDERS, CONTRACTORS, AND MANU-
FACTURERS OF AND DEALERS IN BUILDING
MATERIALS AND APPLIANCES.

C. H. MORTIMER, Publisher,

Confederation Life Building, - TORONTO, CANADA.

Telephone 2362.

64 TEMPLE BUILDING, - MONTREAL.

Bell Telephone 2299.

SUBSCRIPTIONS.

The CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States for \$2.00 per year. The price to subscribers in foreign countries, is \$2.50. Subscriptions are payable in advance. The paper will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrearages paid.

ADVERTISEMENTS.

Prices for advertising sent promptly on application. Orders for advertising should reach the office of publication not later than the 12th day of the month, and changes of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of technical value to the persons in whose interests this journal is published, are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

The "Canadian Architect and Builder" is the official paper of the Architectural Associations of Ontario and Quebec.

The publisher desires to ensure the regular and prompt delivery of this Journal to every subscriber, and requests that any cause of complaint in this particular be reported at once to the office of publication. Subscribers who may change their address should also give prompt notice of same, and in doing so, should give both the old and new address.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1893.

PRESIDENT	-	-	D. B. DICK, Toronto.
1ST VICE-PRESIDENT	-	-	KING ARNOLDI, Ottawa.
2ND VICE-PRESIDENT	-	-	JOHN E. BELCHER, Peterboro'.
TREASURER	-	-	EDMUND BURKE, Toronto.

COUNCIL:

DAVID EWART	-	-	Ottawa.
S. G. CURRY	-	-	Toronto.
S. H. TOWNSEND	-	-	Toronto.
FRANK DARLING,	-	-	Toronto.
W. A. EDWARDS	-	-	Hamilton.

REGISTRAR AND LIBRARIAN:

W. A. LANGTON - Canada Life Building, Toronto.

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1893.

PRESIDENT	-	-	V. ROY, Montreal.
1ST VICE-PRESIDENT	-	-	J. NELSON, Montreal.
2ND VICE-PRESIDENT	-	-	H. STAVELEY, Quebec.
SECRETARY	-	-	A. C. HUTCHISON, Montreal.
TREASURER	-	-	J. Z. RESTHER, Montreal.

COUNCIL:

A. T. TAYLOR, F.R.I.B.A., R.C.A.	-	-	Montreal.
M. PERRAULT	-	-	Montreal.
A. F. DUNLOP, R.C.A.	-	-	Montreal.
J. J. BROWNE	-	-	Montreal.
J. HAYNES	-	-	Montreal.
D. OUELLET	-	-	Quebec.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

WM. PEARS, President.	J. LISTER NICHOLLS.
GEO. MOIR, 1st Vice-President.	WM. BOOTH.
GEO. OAKLEY, 2nd Vice-President.	JAS. ISAAC.
DAVID WILLIAMS, Treasurer.	JOHN LOGAN.
WM. J. HILL.	WM. PARK.
JOHN ALDRIDGE.	H. MARTIN.
JAS. CRANG.	JOHN L. PHILLIPS, Secretary.

THE by-law under which \$155,000 was expended in the erection of new County buildings at Woodstock, Ont., has been declared informal, a vote of the ratepayers not having been taken upon it as required by law. A special meeting of the County Council has been called to frame a new by-law.

THE young architect should be taught to regard the ability to climb a ladder or a series of ladders as one of the essential qualifications of his profession. Without this ability he is not in a position to see for himself that the work on the parts of his building which can be reached only by scaling a ladder, is being properly carried out. Some architects are lacking in this requirement, and rather than take the chances of a fall, are content to take for granted the quality of the work at the top of the ladders.

THE passenger elevator, which has come to be such a universal and highly appreciated feature of every important office building in America, is but little known in Europe. The disappointment in this respect of the Canadian who visits England and is continually obliged to climb stairs is in inverse ratio to that of the European visitor to Canada, who is delighted to find himself carried from bottom to top of the highest buildings without exertion and within the period of a few seconds.

AMERICAN architects are sharing the burden of the depression which at present exists throughout the United States. In New York, Chicago and other large American cities, the staffs are being greatly reduced in architectural offices. Some Canadian draughtsmen employed in American cities have been so fortunate as to be retained in their situations, whilst others have been deprived of them, and are finding their way back to the Dominion where, unfortunately, the chances for employment are none too frequent.

ANOTHER derrick broke down while under strain in Toronto the other day, one of the chains striking and seriously injuring an attendant. The frequency with which accidents of this character have recently occurred should lead contractors to be more careful to see that derricks are sufficiently strong for the work which they are required to perform. If greater care is not exercised the Legislature should step in and protect the lives of workmen. Not alone in Canada but in Great Britain and Australia, accidents from this cause have become frequent, and the necessity of enforcing greater carefulness in order that they may be avoided is properly engaging attention.

A COMPANY has been formed with the object of erecting a crematory in the City of Toronto. The cost of the building and equipment are placed at about \$3,000. A description of the design of the proposed building and of the process of incineration of human bodies, has appeared in the daily press. The amount which is proposed to be risked on the experiment is small, and it is perhaps well for the investors that it is so. The outlook for the success of the venture does not appear to us to be very encouraging. We were recently afforded some particulars concerning the crematory at Buffalo which go to show that institution has not been a profitable one, the favor bestowed the new method having been of a very disappointing character. If such has been the result in an American city, the reason to expect that so important a departure from the usual usage will meet with approval in a community where it is known to be more conservative in their views.

WITH the close of the vacation and the approach of the long evenings incident to autumn and winter, the present would seem to be a fitting time to consider the proposal which has been made that an Architectural Club, composed of architects and students, should if possible be established in Toronto. The desirability of forming a local organization which would provide means of social relaxation as well as profitable instruction for the architects and students of the city, and which would receive the united support of these classes, was clearly set forth in the letter by Mr. A. H. Gregg announcing the dissolution of the Toronto Architectural Club at the close of last winter. We hope that Mr. Gregg will further endeavor to enlist the co-operation of those who should be interested in an endeavor to give practical shape to the idea.

RECENT legislation and the increased caution exercised by the loan companies is strongly tending to force out of the ranks of the builders those who possess little or no capital. These causes, aside from the lifeless condition of the real estate market, are operating to check speculative building in Toronto. Under present conditions the loan companies will not advance money to the builder until his building is ready to be roofed in, and not then even unless he can present a statutory declaration in accordance with the provisions of the amended Mechanics' Lien Law, showing that not more than fourteen days wages are due to his employees. Should the mortgagor fail to satisfy himself on this point before granting a loan, the claim of the employees for arrears of wages is given priority over the mortgage. Under clause 6 of the amended Mechanics' Lien Act, a similar declaration is required for the protection of the owner before payments are made to the builder on account of the work done on his contract. All this means that the builder must have the means to purchase considerable material and pay the wages of his workmen until his contract is well advanced.

WE are pleased to observe that the remarks recently printed in this journal anent the improvement of the water front of the City of Toronto, are seconded in an editorial which has appeared in the *Toronto Globe*, the writer of which says: "On the waterfront is a great stretch of property, from Yonge to York street, affording admirable dockage for the steadily-increasing fleet of passenger steamers that make their head-quarters in Toronto. They carry hundreds of thousands of passengers yearly, many of them tourists, who spend large sums in Toronto. These visitors obtain their first impressions of Toronto, in many cases, from the temporary and ugly sheds around the wharves. First impressions last. The Mayor and Council should see to it that the present season ends all this. The land in question was, after a bitter fight with the C. P. R., reserved for public docks. Full possession of it will be secured in a few weeks at latest, and before the end of the year new and substantial wharves should be built, the place reserved for a public square fixed upon, and reclamation work begun. It will be too late to build the wharves next season before lake traffic opens. The work, if done now, will pay the city a large dividend and will do much to expand the already large lake travel."

THE untiring energy of Mr. E. A. Madconald has once again revived the Georgian Bay canal scheme. With much adroitness he has presented a tempting prospectus—a ship canal and shortened navigation; a power canal with an unlimited supply of water capable of developing more electrical energy than Toronto can use for many a long year; and Lake Simcoe—a happy solution of the water question. The canal question, with shortened water route to the north west lakes, will always present attractions: there are many reasons why the question should be carefully debated; there is good reason for believing that shortened water routes will be acceptable to the commerce of the country. The present canal project alone, (independently of the water power and supply), is one of immense magnitude. To bring the level of Lake Huron to the south side of the water shed known as the Oak Ridges, will require cuttings up to 180 feet deep. When Lesseps tried to do this on the Suez canal, he brought down the whole country side into the sea. In the construction of the Manchester ship canal in England the route was much better known than the country between Toronto and Collingwood. It had been carefully s-

vayed and was thoroughly examined. There were ample data at hand to determine the topography and geology of the route; the promoters were in possession of the fullest possible information before the work was commenced. Unforeseen difficulties encountered during the construction caused the ruin of the company, who had to appeal to the City of Manchester for a very large sum of money to help them along. The Georgian Bay canal and aqueduct scheme is in its present form a visionary proposal, projected by some unknown philanthropic American capitalists for the special benefit of "land poor" Toronto. It is one with which the City of Toronto should have no dealings till it comes recommended by the Board of Trade and some large financial institutions.

MR. SALEY, editor of the *Northwestern Lumberman*, presented a paper to the International Forestry Congress at Chicago, entitled, "Ignorance Concerning Woods." It may interest architects to read his opinion as to their knowledge of the qualities of the various kinds of wood employed in building. It is contained in the following extract: "If I were to arraign more severely one class of men than another for their ignorance concerning woods, it would be our architects, for the reason that it is their business to know. They can tell us about the wearing quality of different stones, the crushing strength of this material and that, but when it comes to any specific knowledge of the lumber used inside of our houses for doors, casings, floors, mopboards and possibly ceilings—objects which are constantly before our eyes—they are woefully ignorant. When furnishing a fine house you select for one room furniture, carpets and draperies of colors to blend, and for adjoining rooms other shades to carry out a general idea of harmony. If the upholstering of the furniture, the carpets, or the portières were to turn another color the harmony would be destroyed. So it may be destroyed through lack of knowledge on the part of the architect. Were you to ask the question, 'I desire to finish my front parlor in one kind of wood, my back parlor in another, the reception-hall in another, my library in another; now as these rooms are practically one, what woods shall I use in order that the harmony may be preserved after the house shall have been in use for years?' I am fearful you would fail to find an architect who could answer it. Architects pay little attention to these vital points, which are really most intimately connected with their business—in fact, are and should be regarded as a part of their business. I am not aware that an architectural journal has given a line to this subject, and the furniture papers are equally dumb." The above criticism could not be fairly applied to Canadian architects, the majority of whom have at least a fairly satisfactory acquaintance with the different varieties of wood. That this acquaintance might with advantage be improved is, however, not to be disputed, and it is also a fact that in no other country can the knowledge be more easily acquired. In this connection we would express the hope that the valuable series of tests of native building stones conducted last year at the School of Practical Science, Toronto, under the direction of a committee appointed by the O. A. A., will in the near future be supplemented by a series of tests under similar conditions, of native woods.

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

The annual meeting of the above Association will be held in the Legislative buildings, city of Quebec, on Thursday, the 28th inst. There will be held both forenoon and afternoon sessions. one of the principal subjects for discussion will probably be the tariff of charges which the Association has asked the legislature to authorize. It is expected that papers will be read by Quebec and Montreal members of the Association. In the evening the annual Association dinner will be held at the Florence Hotel, invitations to which have been extended to members of the Quebec Government, the Rector of Laval University, the Mayor of Quebec, officers of the Ontario Association of Architects, and representatives of the press.

Mr. Thos. Beatty, a respected member of the Toronto Builders' Exchange, died at his residence in Toronto a fortnight ago. The members of the Exchange in a body attended the funeral.

CORRESPONDENCE.

[Letters are invited for this department on subjects related to the building interests. To secure insertion, all communications must be accompanied by the name and address of the author, not necessarily for publication. The publisher will not assume responsibility for the opinions of correspondents.]

ENGLISH STAINED GLASS FOR CANADA.

Three very large and handsome windows of stained glass have just been completed by a local firm (Messrs. Wails & Strang of Westgate-road) and forwarded for shipment to Halifax, Nova Scotia. They are designed for St. Paul's, Halifax, the oldest, largest and most wealthy church in Nova Scotia and commemorate the late Judge of Equity of the Province, John W. Ritchie one of whose brothers is a judge of the Supreme Court of Nova Scotia, and another Sir William Ritchie, recently deceased, was Chief Justice of Canada. These windows are to be erected in the east end of the chancel of the church, and from very superior examples of the glass stainer's art. The subjects are drawn from the life of the Saviour, the central window representing the Ascension, and those to the right and left the bearing of the cross and resurrection respectively. It is interesting to know that this particular industry of Newcastle is largely represented in Canada, the firm in question having numerous examples of their art in Nova Scotia, New Brunswick, Toronto, and throughout the Dominion generally.—*The Newcastle Chronicle*.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—The enclosed clipping from an English newspaper has come under our notice, and we think merits attention. While every one with true artistic instincts would welcome undoubted specimens of the work of the best English designers in stained glass, it seems a cause for regret that when commissions of this kind represents a moderate outlay of money, it should not be spent in Canada. Work such as the firm in question does can be and is easily surpassed by Canadian firms. It is surely time that the idea, so prevalent formerly in other lines, that an imported article is necessarily superior, should have been exploded also in this branch of work as it has in many others.

Yours truly,

ELLIOTT & SON,
94 Bay Street, Toronto.

OBJECT LESSONS FOR STUDENTS.

TORONTO, Sept. 12, 1893.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—I beg to submit herewith a few observations and queries touching work in course of erection as a means of education to students of architecture.

Competent builders must be, first of all, practical men. The practical side of the work does not enter so largely into the essential qualifications of an architect, but the more practical architects and draughtsmen are, the more pleasant will be the relations of all branches of the "allied arts," and the more satisfactory will be the results of all their efforts.

In obtaining the practical knowledge so much to be desired, all students of architecture will no doubt regard works in course of erection as the most helpful. But to what extent do students avail themselves of this help, and to what extent is it available in proportion to the great benefits which should be derived therefrom? An individual draughtsman with ambition, energy, perception and common sense, will occasionally betake himself to some particular job for the purpose of gathering some bits of information. So, also, an opportunity is sometimes afforded to students or architects to visit a special work in a body, under the guidance of an experienced head, thus making such a visit of great interest and profit. But the writer believes that such visits as those referred to constitute a very small part of the attention which should be given to works in course of erection; and I desire to mention one circumstance which I believe operates more than any other to discourage and limit the use of this kind of study. This restraining influence is the fact that all works of such a nature as to be interesting to the student are hedged about more or less with notices of "No Admittance," etc., and a general air of exclusiveness which is not at all conducive to quiet and peaceful observation. I know it is necessary to keep the general public outside of certain limits, to carry on work. Should one venture to penetrate a little beyond this limit, he is very likely to be made to understand that he is regarded as an intruder, and an interference with the progress of the work.

Generally, by going to more or less trouble, a student can get permission to make a solitary visit, or possibly more, to an attractive work. But would it not encourage students to seek out these attractions more frequently if the privileges sought were to be expected as a matter of common courtesy to the profession, instead of being obtained as a special favor?

There are at all times works going on in this city which would be of very great interest and value as objects of study could one but feel at liberty to spend a few minutes on them now and

again while passing and repassing, as they are progressing. The City Hall and Court House and the new Drill Shed might be cited as splendid examples of first-class work. Of particular interest to some students would the iron roof trusses of the Drill Shed be in their present stage. Will anybody pretend that these and other works are benefitting as they should the students of architecture of the city?

Suppose it should be announced throughout the province that Toronto proposed to expend two millions of dollars or so in the next five years in providing the best possible object lessons for students of architecture, would it not create great enthusiasm? And is not just such work being done without any regard for its utility in the direction here suggested?

Now I believe, that if it was generally understood throughout the building trades, and among architects and students, that a special uniform card or badge, presented at the entrance to any work, public or private, would secure cheerful admittance and courteous treatment within reasonable limitations, students would make ten such visits for every one that is now made. Would not such an arrangement be worthy of the kindly consideration of architects and builders, with a view of placing practical knowledge within easier reach of those interested, in some such way as here suggested?

STUDENT.

ILLUSTRATIONS.

DESIGN FOR A SMALL TOWN HOUSE.

The house comprises parlor, dining room and kitchen on ground floor, four bed rooms and bath room on first floor, and two bed rooms and store room in attic, besides closets, pantries, &c. It is of frame construction. Externally the entire building may be shingled, or if desired, clap boards may be used up to the water-table above ground floor.

If cedar shingles be used, they will need no staining, but the window sash and frame and all other external woodwork should be painted white. Interior wood work, if of pine, should be painted white or in light tones to harmonize with the decorations of the various rooms.

A sheet of details to accompany this design will be published in the ARCHITECT AND BUILDER for October.

This house would cost, according to local conditions, from \$2,000 to \$2,500.

HOUSE ON ST. GEORGE STREET, TORONTO, FOR MR. ALEX. MCARTHUR.—D. B. DICK, ARCHITECT.

In this house all the cut stone work, also the coursing and squared rubble, are of brown Credit Valley stone, and the gables are tile hung. The house contains 4 public rooms and 9 bedrooms and dressing rooms, exclusive of those for servants; also 2 bathrooms. The principal rooms, the bathrooms and the main halls and staircase, are all finished in polished hardwoods of different kinds, including quarter cut white oak, mahogany, bird's eye maple, cherry and chestnut. The windows are finished with sliding shutters. The house and conservatory are warmed by hot water, and the lighting throughout is by gas and electric light combination fixtures. The total cost was about \$25,000.

CARVED PANELS IN THE RESIDENCE OF MR. DUNCAN MCINTYRE, MONTREAL—W. T. THOMAS, ARCHITECT;
H. BEAUMONT, SCULPTOR.

ERSKINE CHURCH, MONTREAL—A. C. HUTCHISON, ARCHITECT.

PERSONAL.

Mr. A. E. Wells, who during the last year has been in the office of a New York architectural firm, spent his vacation in Toronto and at Niagara-on-the-Lake.

The marriage is announced at St. Southsea, Eng., on the 3rd of August, of Mr. E. W. Rathbun, president of the Rathbun Co., Deseronto, Ont., to Miss Aileen Blair.

Mr. Richard Bond, who was one of the pioneers in railroad construction in Canada, died at his daughter's residence in Toronto on the 12th of August, aged 82 years.

TO MAKE POSITIVE COPIES OF DRAWINGS.—The paper to receive the impression is coated with a two per cent. solution of bichromate of ammonium, to which a little grape sugar has been added and then dried in the dark. The sheet containing the drawing is laid upon the prepared paper and exposed to the light until the paper has assumed a gray color. It is now dipped into a 1 per cent solution of nitrate of silver, one-tenth of the volume of which consists of acetic acid. The positive image developed thereby becomes dark brown on drying.

QUESTIONS AND ANSWERS.

[Readers are invited to ask through this department for any information which they may require on lines consistent with the objects of the paper. Every effort will be made to furnish satisfactory answers to all such inquiries. Readers are requested to supply information which would assist us in our replies. The names and addresses of correspondents must accompany their communications, but not necessarily for publication.]

A Nova Scotia subscriber, "H. E. G.," writes: Can you give me the name of the Professor in Architecture in the School of Practical Science, Toronto? I desire to apply for particulars regarding tuition, etc.

Ans.—Address Mr. C. H. C. Wright, Lecturer in Architecture, School of Practical Science, Toronto.

THE DORIC ORDER.

IN the Doric order, the number of channels is either sixteen or twenty,—afterwards increased in the other orders to twenty-four; for they are invariably of an even number, capable of being divided by four; so that there shall always be a center flute on each side of the column, that is, in a line with the middle of each side of the abacus. Doric flutings are much broader and shallower than those of the Ionic or Corinthian orders; broader for two reasons,—first because they are fewer in number; and secondly, because there are no *fillets* or plain spaces left between them on the surface of the shaft. Their proportionately much greater shallowness, again, may be accounted for equally well; were the channels deeper not only would they seem to cut into the shaft too much, and weaken it, but also produce much too strong shadows, and another inconvenience would be occasioned, for the *arrises* or ridges between the channels would become very sharp and thin, and liable to be injured. The mode of fluting Doric columns with more *arrises* between the channels instead of *fillets*, has been retained by the moderns as characteristic of the order; but, as the order has been treated by them, it is little better than a mere distinction, with very little regard to general character. In the original Doric, almost every part is marked by breadth or by flatness, or by sharpness. There are no curved mouldings or surfaces, except the *cyathium* of the cornice and the *echinus* of the capital, which last is generally kept exceedingly flat. The breadth and shallowness of the channels, and the flat curves in which they commence and terminate, are therefore in perfect keeping with the style in other respects; so also are the sharp *arrises* or ridges between the channels or flutings on the surface of the shaft, they being expressive of a severe simplicity. The same remark applies to the horizontal annular narrower channels or more incision immediately beneath the *echinus* of the capital, and lower down, which last are just the reverse of the projecting astragal or convex mouldings given to the Doric capital by the moderns. Why such horizontal channels or grooves should have been cut in the very thinnest and weakest part of the column, where they diminish instead of adding to strength, it is not easy to say, except that they were merely for the sake of effect,—of producing shadow, and increasing the proportions of the capital to which they belong. We leave others, should any be so disposed, to object that the lowermost groove or grooves, as the case may be, give the capital the appearance of being a separate piece, merely joined on to the shaft, without such joining being concealed. Looking at it differently, we will rather say that such groove is intended to mark to the eye the commencement of the capital, the proportion above it of the shaft being thereby converted into the *hypotrachelium* or necking of the capital itself, which is thus enlarged in appearance, without being actually increased, and rendered unduly heavy. It is not, however, every example of the order that has such necking; while in some the groove separating the capital from the shaft is diminished to a mere line,—which looks like a joining not intended to show itself,—in others it is omitted altogether. With respect to the *echinus* we have little more to remark than that its office—which it performs admirably,—is by expanding out, to connect the diminished upper end of the column with the overhanging abacus; and the former being circular and the latter square, but adapted to each other in size, a beautiful combination is produced of a circle inscribed within a square; and the result is variety, contrast, and harmony. In its profile or section—by which latter term is understood the contour of any moulding or other member,—it is usually very flat, little more than a portion of a cone (turned downwards), with scarcely any perceptible degree of

convexity, except just beneath the abacus, where it is suddenly rounded and diminished, so that the abacus does not seem to press upon or compress it too much.—*Granite Cutter's Journal*.

MONTREAL.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

The Building Inspector for the city of Montreal is a most efficient officer, and might well be taken as an example by the inspectors in other Canadian cities. Scarcely a week passes in which he does not figure as the prosecutor of persons who violate the city building ordinance. He has just entered actions against a number of individuals and corporations for having neglected to take out permits for new buildings. I have noticed by the ARCHITECT AND BUILDER that the by-laws of Toronto, Hamilton and other cities, are not complied with in this respect, and that no determined effort on the part of the Inspectors appears to be made to enforce the law. Building laws, like laws of other kinds, are valueless if not enforced.

The contractors for public works have been complaining for some time past of the scarcity of workmen, and in some cases have sent into the country to endeavor to secure laborers. Notwithstanding this condition of affairs, the local unions have petitioned the Council against allowing the employment of outside workmen. Such a dog in the manger spirit deserves no encouragement.

A petition is being largely signed by the citizens for presentation to the City Council asking that the Chateau de Ramezay opposite the City Hall be purchased by the city and used as a public library and museum. The petition states that the Chateau is one of the few remaining buildings of the old regime, and by reason of its historic importance as a monument of old Ville Marie, should be preserved.

Several actions at law have arisen out of the construction of a large chimney for the Royal Electric Company. The design for the chimney was prepared by Mr. McLea Walbank, architect. Mr. Alex. Wand was the contractor for the work. Owing as it is alleged to defects having been discovered subsequent to completion, a portion of the chimney was torn down and rebuilt. For this purpose it is said the plans were modified. Mr. Wand brought an action for the value of his work, but the case was dismissed. Now the company has brought suit for the cost of demolition and reconstruction of the chimney on the new plans; and Mr. Wand is suing the architect, on the ground that the loss and damage were not caused through any fault of the workmanship, but through defective plans.

From the twenty-five designs submitted by artists for the statue to be erected on Dominion Square to the memory of the late Right Hon. Sir John A. Macdonald, the Design Committee acting with the advice of experts, have chosen that of Mr. Geo. E. Wade, the well known London sculptor. The statue will cost \$20,000, and is to be ready to be unveiled during the autumn of 1894.

Messrs. Vanier & Keefer, the engineers appointed to report on the means which should be adopted to improve the efficiency of the Montreal city water works, has recommended the expenditure of \$100,000 in new plant and improvements, including a 10,000,000 gallon pumping engine and a new engine for the high level service.

OTTAWA.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

The total expenditure on the erection of new buildings and on improvements to existing buildings in this city during the last year is stated at \$350,000. This is about equal to the amount expended in 1892, and considerably less than in some previous years. In view of the scarcity of dwellings of moderate size and the high rentals which owing to this fact must be paid by those who are not fortunate enough to own their own houses, a good opportunity appears to exist for builders to make money by erecting a number of dwellings of the class mentioned. Enquiry reveals the fact that rents are very much higher in Ottawa than in Toronto.

While writing on this subject I may also refer to the excessive water rate which is imposed in this city. I was recently informed by a gentleman residing here, and who is the owner of property in Toronto, that the cost of water in Ottawa is more than double what it is in Toronto. It is difficult to understand why this should be the case, seeing that in this city there is no expensive pumping plant to be maintained, such as exists in Toronto. It would seem that large profits are being derived from the sale of water, and are applied to pay the expense of other departments of the public service. If so, the principle is a wrong one, and the citizens should insist on each department being maintained on a distinct footing.

Building operations at Stratford, Ont., during the present year are said to be 50 per cent. in excess of 1892.



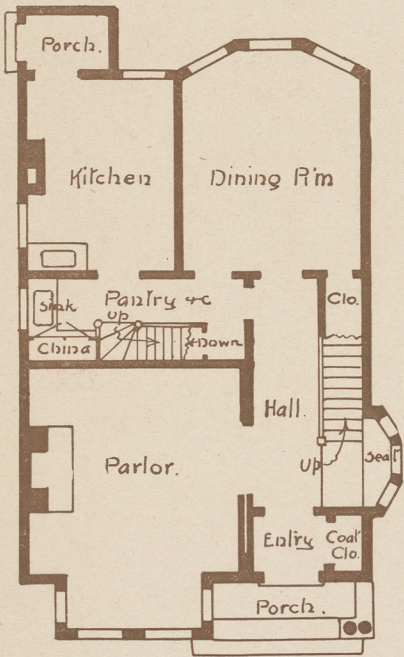
ERSKINE CHURCH, MONTREAL.

A. C. HUTCHISON, ARCHITECT.

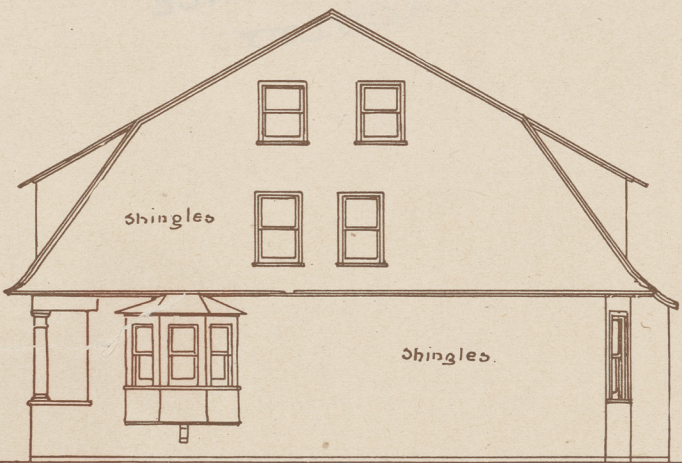
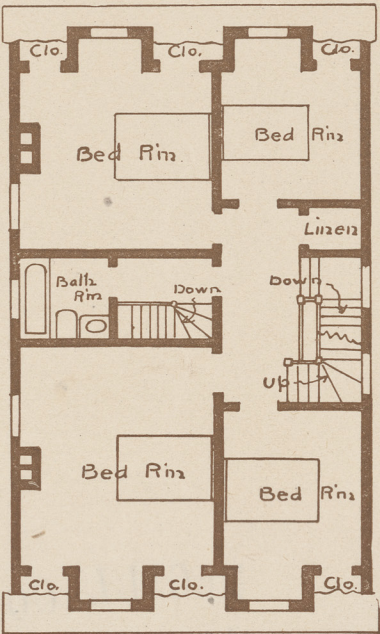
McGILL COLLEGE
APPLIED SCIENCE
FACULTY.

A SMALL TOWN HOUSE.

Scale 1" = 10 ft.

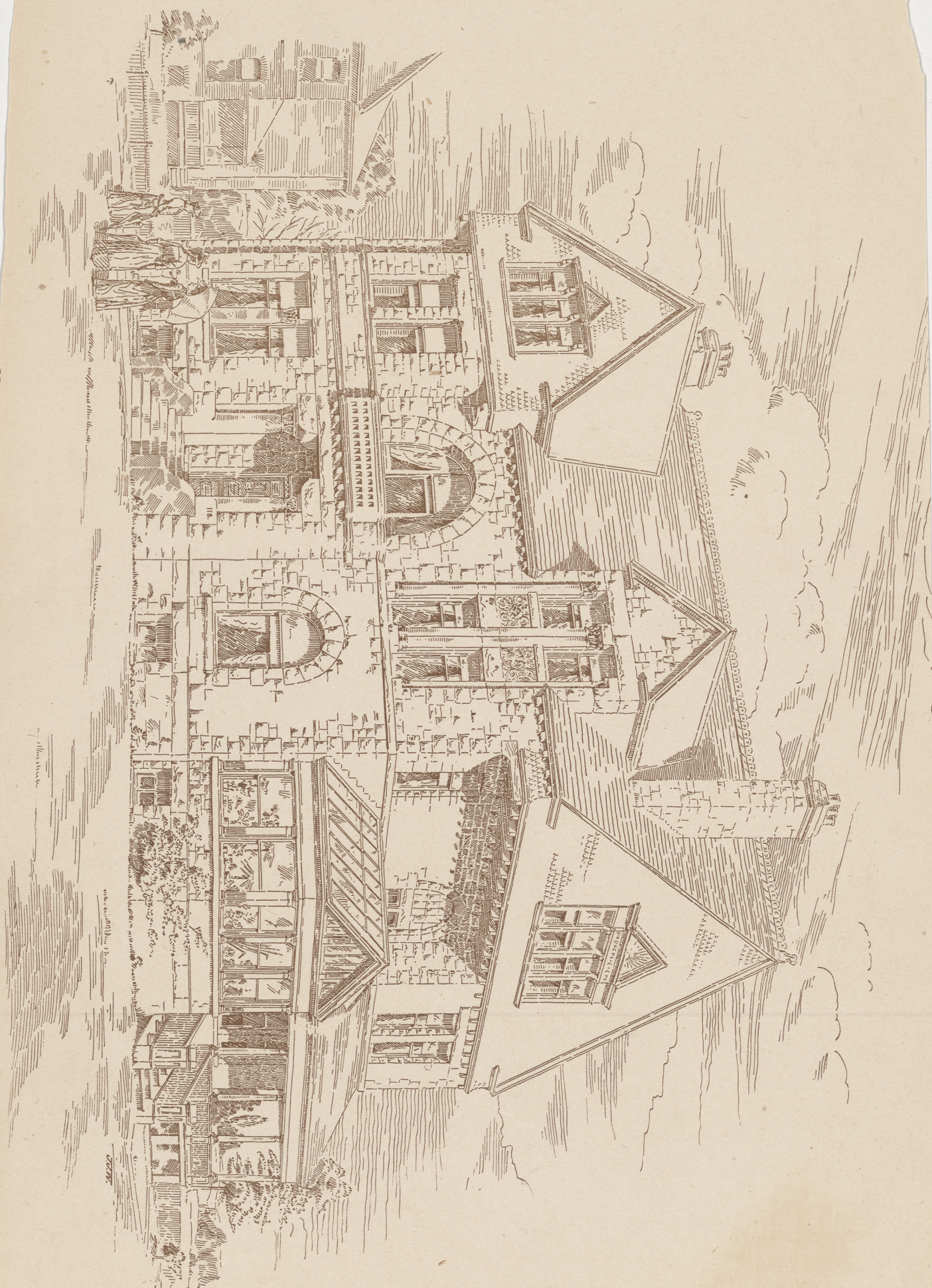


Note:- Two Bed Rooms and Lumber Rooms in Attic.



Elevations.

McGILL COLLEGE
APPLIED SCIENCE
FACULTY.



TECHNICAL REQUIREMENTS OF ARCHITECTS.

WHAT to specify is a question that often gives rise to some hesitation in the minds of many architects. They can design with tolerable completeness in the main structure, its general accommodation, the plan of its floors; but when the fittings and details have to be considered, the extent of the architect's knowledge is reached. The rest is technical and precise; it is thought to have no connections with, or relation to the design. Many in the profession think that their proper and legitimate work is accomplished when they have prepared the design, and that they have nothing to do with questions of heating, lighting, or ventilation; what kind of appliances and fittings are to be provided and fixed. If we should ever come to view the art in this light, we should be ignoring completely all opportunities of making architecture commensurate with the progress of science and the development of our industries. This view of restricting the building art would be to keep architecture back, and to prevent her from controlling and moulding the agencies which affect our civilization and material wants. If art is really to direct the fashioning of our commonest objects, of our chairs and tables, and to permeate the everyday objects of our domestic life, it is the true office of architecture to bring everything that contributes to the convenience and comfort of our buildings under her influence. The radiator, the heating stove, the electrolier, the gasolier, the ventilating inlet and outlet, even those appliances by which we perform the commonest functions of life or of trade, fall rightly under its influence. If we think aright, what has been called the "hierarchy" of art implies a descending scale. The modes of classification adopted, such as that which makes Architecture, Sculpture, and Painting the primary trinity, have apparently excluded the useful arts. These three primary arts represent an ascendancy of thought and feeling from the structure raised by the architect to the more idealised and ethereal productions of the sculptor and painter; the material yields to the spiritual. But does not architecture represent more than the mere outside shell of the building? Does it not descend to every fitting and contrivance which finds a place in the building? We have too long set a limit to architecture, and we have not considered that it commences at the very beginning of the conversion of the raw materials, and also includes everything besides floors and walls, doors and windows.

These thoughts are necessary to help us to see the universality of the art of the architect, that his work is wider and deeper than that of making an embellished building of brick or stone, and then leaving it to be finished and made convenient, or comfortable, or healthy by the fitter or engineer. Specification ought to imply selection. What to select is as important a question to the architect as how to design, because the exercise of his knowledge and taste may be, and is often, quite as much called into requisition by one as the other. For example, in looking over an illustrated catalogue, or the stock of goods in a showroom of an ironmonger, the architect has to call into exercise many of those very faculties he uses in designing the given article. If it is a drawing-room stove, he has to look to see whether the construction is likely to be economical in the use of fuel, whether the firebrick back is of good form for radiating the heat, and the opening for smoke shaped so as to avoid eddying currents and smokiness. He chooses the one which he thinks will be the best; he will avoid the more ornamental patterns, or those which are unnecessarily showy with cast ornament tiles and brasswork. But if the stove is merely specified in the usual terms, and the selection is left to the employer or to the builder—a mode often adopted—a very different result follows. Probably the most showy and the least efficient as a fuel economizer and heat radiator will be selected. To specify and not to select is an imperfect procedure, calculated to bring discredit on the architect, while it only gives temporary pleasure to the employer. In matters requiring scientific knowledge, the architect's opinion may be asked—say, for example, a heating apparatus, or a ventilating exhaust; but in artistic things, like ornamental gas-fittings or tessellated paving, the selection is often left to the client, who thinks himself quite as good a judge in matters of taste. The provisional sum inserted in specifications has at least the effect of preventing a contractor supplying inferior articles. An amount may be provided for a mantel piece or any decorative work, but unless the architect has a voice in the design, even this mode of provision may be rendered of little value. Most

specifications are two discursive and inexplicit, and architects unfortunately attach little importance to inventions and appliances, imagining that it is not their principal business. The great evil of this indifference to fittings and details is that the makers cater to please the public taste, for if there is no one to select and examine that knows something about the matter, they have no encouragement to make valuable improvements, or to expend capital in the production of artistic designs.

Three principal classes of goods comes under the notice of the architect in specifying. The first are the structural requirements and materials, in which we may include inventions to prevent the rising of damp in walls, damp-proof courses, materials for building walls, floors of fireproof construction, window-sashes, iron work; a second class comprehends the various internal fittings of buildings, like sanitary, gas, electric-light fittings, heating and ventilating appliances; and the third class artistic and decorative details.

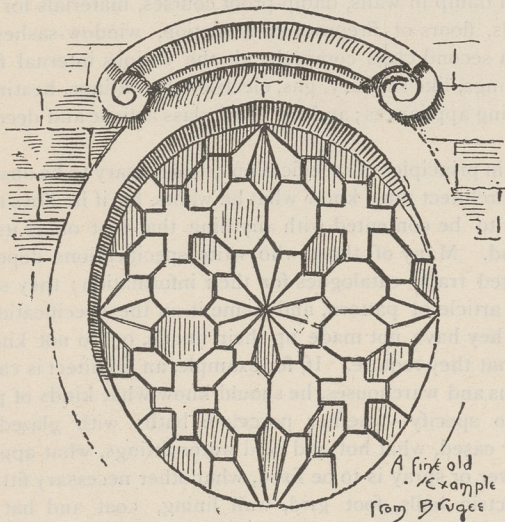
Certain principles of specification are necessary to be observed:

(1) An architect must know what he wants, for if he does not, he is likely to be contented with anything that first offers itself to his mind. Many of those who write specifications depend on illustrated trade catalogues for their information; they select a certain article or pattern, and name it in the specification, because they have not made up their minds, or do not know exactly what they require. If, for example, an architect is carrying out baths and warehouses, he should know what kinds of private baths to specify—whether porcelain baths with glazed rims, whether cased, what hot and cold water fittings, what apparatus for shower or spray is to be fixed, what other necessary fittings—like electric bells, foot grid, wall lining, coat and hat pegs, and mirror—are to be provided. What he wants can only, therefore, be answered by a knowledge of the requirements of baths, and surely this it worth finding out before referring to a trade catalogue. In warming and ventilating it is absolutely necessary to find out the conditions of the building, how it is affected by cold winds, by cold surfaces such as glass, and to find out what proportion the heating surface must bear to the cubic feet of air necessary to be warmed. To specify without such knowledge is to leave all in the hands of the engineer or contractor, who may be tempted to take a very inadequate estimate of the requirements. (2) How to obtain it. The name of a firm is often a sufficient guarantee of skill and good workmanship. The architect may adequately supply his own deficiency by naming firms of repute to execute these works. The "approved apparatus" of the contract is often left to someone who has no reputation, and no one is responsible for its efficiency. But by naming any one of the firms which are known to do satisfactory work, the architect obtains at least competent experience and the guarantee of a responsible name. There are a few ways open to the architect. One of the best is to consult the pages of a respectable professional journal, where he may find lists of makers and vendors of building specialties. Our own Directory of the Building Trades may be of value. The larger firms whose special branches have a wide repute take care to draw attention to any improvements of manufacture or new appliances which they bring out, and the architect of to-day, if he desires to keep himself "up to date" with materials or improved systems, will find it necessary to make himself acquainted with them, or the catalogues and descriptive literature of well-known firms. Technological museums are another means by which the profession and the tradesman can be brought to know each other's wants. An instance of a sanitary museum equipped with appliances for the instruction of builders we lately noticed instituted by the Hornsey Local Board. Attached to it is a library and testing room. The builders' "Exchange," so common in America, is a means of mutual benefit; and in connection with our technical schools and architectural schools, as that of King's College, a start has been made to collect typical specimens of manufactures and fittings, though very incomplete at present. The way of all others the most practical is to visit buildings and establishments where systems and goods have been produced, and to obtain experimental evidence of the actual working and effect. Firms of manufacturers often give the profession and Press opportunities of seeing for themselves the operation of improved appliances, though there is naturally a limit to this, as it is not always convenient to inspect public and private establishments in working order. These are some of the ways by which the practitioner may learn the value of specialties. In the artistic class he is more free, not being hampered by technical points and want of experience. What and how to specify is not the least onerous and responsible of the architect's duties, for it implies a wide knowledge of details, and a general acquaintance with the principles of science, more especially of hygiene, pneumatics, heat, and the laws of light and sound.—*Building News.*

DECORATION AND FURNITURE

LEADED WINDOWS.

THE increasing love of picturesqueness and quaintness in our dwellings has caused us to revive and admire in the present day many of the old customs and fashions of our remote forefathers. Strangely, too, says *Furniture and Decoration*, we have thus often reproduced from sheer choice those very things that were made some centuries ago from absolute necessity. In no matter



1703

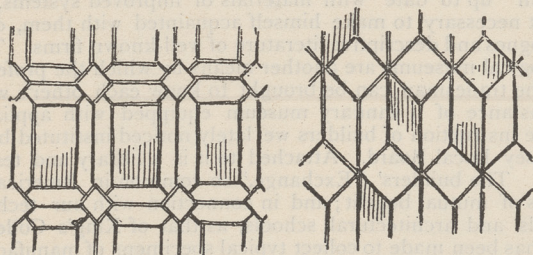
FIG. 1.

of household taste is this peculiar fact more demonstrated than in the present revival of leaded windows.

In olden days when glass was dear and difficult to make in large pieces the subtle cunning of "ye skilful glazier" prompted him to join his little bits of glass into a large window by means of grooved leads. Into these "comes" he set his small panes, adding piece to piece, until by dint of such conjunctions he produced a lattice or sliding window to fit the wall opening which it was his mission to fill.

Now these old leaded windows—even the simplest of them, as seen in some of the country cottages at the present time—are remarkably picturesque, and many of them are admirable lessons in design, and bespeak much gifted thought upon the part of him who first invented them. It is no wonder then that they are nowadays so assiduously studied and revived, and it is well that such charming and homely embellishments to the modern house should continue to be regarded with the admiration that they deserve.

The several fine old examples of leaded windows which appear on this page have been collected from various places at



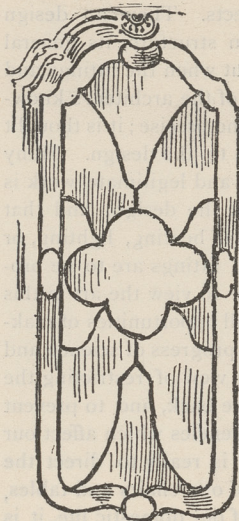
Two Examples from Moreton Hall, Cheshire.

FIG. 2.

home and abroad, hence they are considerably diversified in character. The first sketch shows a delightful old window which we noted some time since in the sleepy silent town of Bruges. It is an example designed with consummate skill, and may be regarded as a standard of excellence in its particular style.

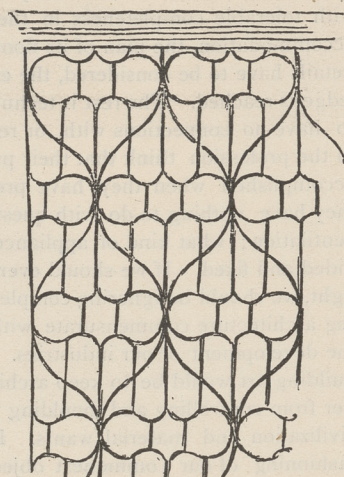
Figs. 2 and 3 are rough notes of two leaded windows existing at Moreton Hall, Cheshire. The first of these is simple and formal, but the second is more fanciful, and is evidently intended to illuvisely convey an idea of projection by the geometrical arrangements of the diamonds and straight bars.

The next example (Fig. 4) diverts our attention in the direction of French art, and will doubtless be useful to our conferees



A French Example
Louis XV period

FIG. 3.



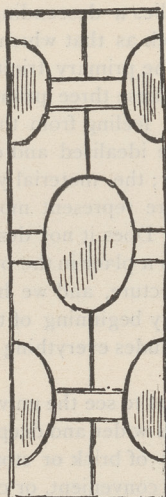
An Old English Pattern
Tudor Period

FIG. 4.

as a *bona fide* specimen of leaded work of the Louis Quinze period. It should not be forgotten that in much of the leaded

work of that period, gilt was largely employed to enhance the effect.

The next sketch (Fig. 5) presents us with a beautiful specimen of old Tudor work. The flow of the lines and the consequent dropping of the pattern, the evident strength of the judiciously joined glass, are points that must at once commend this example to our attention. There is just sufficient Gothic feeling in it to make it interesting, whilst the abundance of easy curves in its outline make it agreeable even to the taste of those who dislike mediæval art.



Small Leaded Window in
Michael Angelo's Studio at
Florence

FIG. 5.

The last illustration is interesting, not only because of its design, but also on account of its associations. It is a sketch of a small window in Michael Angelo's private study in his house, or rather palace, at Florence. Whether it was designed by the great master or not it is impossible to say, but that it was in his house will be, to most of us, a sufficient recommendation of its beauty.

LEGAL DECISIONS.

MORRIS V. THARLE.—Judgment of the Chancery Court on appeal by the plaintiff from an order of Meredith, J., in Chambers, upon appeal from a Master's certificate, disallowing the claim of the plaintiff, a material man, to establish a mechanic's lien upon the land of the defendant Ryan, upon the ground that the registration was late, having regard to the times of the supplying of the materials. The court held that the plaintiff's sub-contract with the defendant Tharle, the contractor, must be considered a continuing contract for the supply of all the goods, and although some of the articles supplied were not within thirty days of the registration, the plaintiff was entitled to the benefit of his lien. Appeal allowed with costs, to be added to the plaintiff's claim.

SPANISH GLASS.—The first mention of glass works in Spain is found in Pliny and the next allusion to this is in the works of San Isadore, who lived in the seventh century. Glass was made to a great extent in the Spanish Peninsula during the Roman period. The manufacture had ceased to exist in the seventh century. There are no specimens of Spanish glass of the Visigothic period, but from the eighth to the fifteenth century it is inferred that the industry of glass making became as important in Spain as that of pottery. No specimens of the earlier period, however, have reached our time, and we must judge of what it is from the glass vessels belonging to the Renaissance period, which preserve their oriental form and are of a different style to that of Venice and other localities in Europe.

PAINTERS' MEASUREMENTS.

IN England the custom is to employ a clerk quick at figures, whose duty it is to take off, from the plans and specifications, an accurate list of all the materials and labor required in the performance of the work, setting down in each case the number of yards or feet, as the case may be, of each item. In the case of painting, the figures obtained for the carpenter and joiner prove of service also for the work to be done by the painter. The following is a table that is intended to indicate the method of measurement of painters' work, and also the order in which the various items may be taken. A similar table added to, or changed, as might be necessary to suit American methods of construction, would be very useful to have on hand when getting out estimates, as it would insure nothing being left out. The table which follows accurately indicates the English practice :

Lead, in oil on white work, at—per yard super.	
“ “ cement “ “ “ “	
Ornamental railings, etc., “ “ “ “	
Skylights, “ “ “ “	
Skirtings, 12 in. girth and under, at—per ft. run.	
Strings, “ “ “ “	
Chair rails, “ “ “ “	
Hand “ “ “ “	
Balusters, “ “ “ “	
Newels, “ “ “ “	
Rain pipes, “ “ “ “	
Ornamental heads, “ “ “ “	number.
Ears “ “ “ “	
Shoes, “ “ “ “	
Eaves, gutter, “ “ “ “	foot run.
Stopped ends, “ “ “ “	number.
Outlets, “ “ “ “	
Swan necks, “ “ “ “	
Cement reveals (jambs) “ “ “ “	foot run.
Cornices under — girth “ “ “ “	
Window sills, “ “ “ “	
Coping edge, “ “ “ “	
Stone strings, “ “ “ “	
Stone plinths, “ “ “ “	
Iron castings, “ “ “ “	
Grate bars “ “ “ “	
Sash squares, “ “ “ “	dozen.
Sash frames, “ “ “ “	number.
Small “ “ “ “	
Two-light casement frames, “ “ “ “	
Four “ “ “ “	
Sash squares, “ “ “ “	dozen.
Brackets, “ “ “ “	number.
Finials, “ “ “ “	
Step ladders, “ “ “ “	
Dressers, “ “ “ “	
Chimney pieces, “ “ “ “	
Four oils and extra finished varnish, gray, “ “ “ “	yard super.
Grainer; extra grain for wainscot and twice varnish, “ “ “ “	
Grainer; extra grain enrichment for brackets 4 in. wide, “ “ “ “	foot run.
Stainer; stain to an approved tint and twice varnish with the best copal varnish, “ “ “ “	foot super.
French polisher; French polishing, “ “ “ “	
French polishing to hand rails, “ “ “ “	foot run.
Gilder; gilding on flat surface, “ “ “ “	foot super.
Gilder on carved work, stating height and description, “ “ “ “	foot run.
Molded work, stating girth, “ “ “ “	
Boards, etc., “ “ “ “	
Carved caps, “ “ “ “	
Brasses and simple items of a similar nature, “ “ “ “	

A FAVORABLE COMPARISON.

MR. James A. Macdonald, architect, Regina, Assa., writes as follows: “Enclosed please find \$2, for which please send to me for one year the CANADIAN ARCHITECT AND BUILDER. I have been taking your paper through the news dealers, and like it very much, as I consider it compares very favorably with the best American publications of the same class.”

A FRENCH METHOD OF WARMING HOUSES.

To sum up these new methods, the teachings of M. Somesco, suggest that the natural porosity of the walls, especially the outer walls should not be destroyed. These walls should be decorated, not with paper and paint, but with porous, non-conducting substances, such as wooden drapery. The outer walls on the side nearest to the inner surface should be hollowed throughout, thus constituting a double wall, with a space of about four inches between the two walls. A heating contrivance, of whatever description may be found most expedient or economical, should be placed in the basement of the house. A warm-air chamber or shaft traveling round the base of the outer walls should supply to the hollow in the walls air taken from the outside and warmed at the point of admission in the wall to a temperature of from 100 degrees to 120 degrees Fahr. This should maintain the temperature of the inner wall at from 80 degrees to 90 degrees Fahr. Then he considers, the walls will radiate sufficient heat through the rooms to enable the inhabitants to constantly open the doors and windows, and to breathe cold, fresh, outer air without inconvenience. As a rule fires will be unnecessary, dampness will be completely banished from the house, and to maintain some moisture in the air it would, he thinks, be expedient to decorate the house with numerous evergreen plants. The inhabitants should then be able to benefit by unlimited ventilation, and could breathe pure, cold, and fresh air, coming upon them directly from the outside.—*Popular Science Monthly.*

NUMBER OF SLATE IN ANY NUMBER OF SQUARES, FROM ½ UP TO 60 SQUARES.

24 × $\begin{Bmatrix} 14 \\ 12 \end{Bmatrix}$	43	85	171	258	343	428	515	600	685	772	857	943	1029	1115	1200	1286	1372	1458	1543	1629	1715	2572	3449	4286	5143	5977	6857	7714	8571	9434	10297	11150	12003	12856	13709	14562	15415	16268	17121	17974	18827	19680	20533	21386	22239	23092	23945	24798	25651	26504	27357	28210	29063	29916	30769	31622	32475	33328	34181	35034	35887	36740	37593	38446	39299	40152	41005	41858	42711	43564	44417	45270	46123	46976	47829	48682	49535	50388	51241	52094	52947	53800	54653	55506	56359	57212	58065	58918	59771	60624	61477	62330	63183	64036	64889	65742	66595	67448	68301	69154	70007	70860	71713	72566	73419	74272	75125	75978	76831	77684	78537	79390	80243	81096	81949	82802	83655	84508	85361	86214	87067	87920	88773	89626	90479	91332	92185	93038	93891	94744	95597	96450	97303	98156	99009	99862	100715	101568	102421	103274	104127	104980	105833	106686	107539	108392	109245	110098	110951	111804	112657	113510	114363	115216	116069	116922	117775	118628	119481	120334	121187	122040	122893	123746	124599	125452	126305	127158	128011	128864	129717	130570	131423	132276	133129	133982	134835	135688	136541	137394	138247	139100	139953	140806	141659	142512	143365	144218	145071	145924	146777	147630	148483	149336	150189	151042	151895	152748	153601	154454	155307	156160	157013	157866	158719	159572	160425	161278	162131	162984	163837	164690	165543	166396	167249	168102	168955	169808	170661	171514	172367	173220	174073	174926	175779	176632	177485	178338	179191	180044	180897	181750	182603	183456	184309	185162	186015	186868	187721	188574	189427	190280	191133	191986	192839	193692	194545	195398	196251	197104	197957	198810	199663	200516	201369	202222	203075	203928	204781	205634	206487	207340	208193	209046	209899	210752	211605	212458	213311	214164	215017	215870	216723	217576	218429	219282	220135	220988	221841	222694	223547	224400	225253	226106	226959	227812	228665	229518	230371	231224	232077	232930	233783	234636	235489	236342	237195	238048	238901	239754	240607	241460	242313	243166	244019	244872	245725	246578	247431	248284	249137	250000	250853	251706	252559	253412	254265	255118	255971	256824	257677	258530	259383	260236	261089	261942	262795	263648	264501	265354	266207	267060	267913	268766	269619	270472	271325	272178	273031	273884	274737	275590	276443	277296	278149	279002	279855	280708	281561	282414	283267	284120	284973	285826	286679	287532	288385	289238	290091	290944	291797	292650	293503	294356	295209	296062	296915	297768	298621	299474	300327	301180	302033	302886	303739	304592	305445	306298	307151	308004	308857	309710	310563	311416	312269	313122	313975	314828	315681	316534	317387	318240	319093	319946	320799	321652	322505	323358	324211	325064	325917	326770	327623	328476	329329	330182	331035	331888	332741	333594	334447	335300	336153	337006	337859	338712	339565	340418	341271	342124	342977	343830	344683	345536	346389	347242	348095	348948	349801	350654	351507	352360	353213	354066	354919	355772	356625	357478	358331	359184	360037	360890	361743	362596	363449	364302	365155	366008	366861	367714	368567	369420	370273	371126	371979	372832	373685	374538	375391	376244	377097	377950	378803	379656	380509	381362	382215	383068	383921	384774	385627	386480	387333	388186	389039	389892	390745	391598	392451	393304	394157	395010	395863	396716	397569	398422	399275	400128	400981	401834	402687	403540	404393	405246	406099	406952	407805	408658	409511	410364	411217	412070	412923	413776	414629	415482	416335	417188	418041	418894	419747	420600	421453	422306	423159	424012	424865	425718	426571	427424	428277	429130	430000	430853	431706	432559	433412	434265	435118	435971	436824	437677	438530	439383	440236	441089	441942	442795	443648	444501	445354	446207	447060	447913	448766	449619	450472	451325	452178	453031	453884	454737	455590	456443	457296	458149	459002	459855	460708	461561	462414	463267	464120	464973	465826	466679	467532	468385	469238	470091	470944	471797	472650	473503	474356	475209	476062	476915	477768	478621	479474	480327	481180	482033	482886	483739	484592	485445	486298	487151	488004	488857	489710	490563	491416	492269	493122	493975	494828	495681	496534	497387	498240	499093	499946	500799	501652	502505	503358	504211	505064	505917	506770	507623	508476	509329	510182	511035	511888	512741	513594	514447	515300	516153	517006	517859	518712	519565	520418	521271	522124	522977	523830	524683	525536	526389	527242	528095	528948	529801	530654	531507	532360	533213	534066	534919	535772	536625	537478	538331	539184	540037	540890	541743	542596	543449	544302	545155	546008	546861	547714	548567	549420	550273	551126	551979	552832	553685	554538	555391	556244	557097	557950	558803	559656	560509	561362	562215	563068	563921	564774	565627	566480	567333	568186	569039	569892	570745	571598	572451	573304	574157	575010	575863	576716	577569	578422	579275	580128	580981	581834	582687	583540	584393	585246	586099	586952	587805	588658	589511	590364	591217	592070	592923	593776	594629	595482	596335	597188	598041	598894	599747	600600	601453	602306	603159	604012	604865	605718	606571	607424	608277	609130	610000	610853	611706	612559	613412	614265	615118	615971	616824	617677	618530	619383	620236	621089	621942	622795	623648	624501	625354	626207	627060	627913	628766	629619	630472	631325	632178	633031	633884	634737	635590	636443	637296	638149	639002	639855	640708	641561	642414	643267	644120	644973	645826	646679	647532	648385	649238	650091	650944	651797	652650	653503	654356	655209	656062	656915	657768	658621	659474	660327	661180	662033	662886	663739	664592	665445	666298	667151	668004	668857	669708	670561	671414	672267	673120	673973	674826	675679	676532	677385	678238	679091	679944	680797	681650	682503	683356	684209	685062	685915	686768	687621	688474	689327	690180	691033	691886	692739	693592	694445	695298	696151	697004	697857	698710	699563	700416	701269	702122	702975	703828	704681	705534	706387	707240	708093	708946	709799	710652	711505	712358	713211	714064	714917	715770	716623	717476	718329	719182	720035	720888	721741	722594	723447	724300	725153	726006	726859	727712	728565	729418	730271	731124	731977	732830	733683	734536	735389	736242	737095	737948	738801	739654	740507	741360	742213	743066	743919	744772	745625	746478	747331	748184	749037	749890	750743	751596	752449	753302	754155	755008	755861	756714	757567	758420	759273	760126	760979	761832	762685	763538	764391	765244	766097	766950	767803	768656	769509	770362	771215	772068	772921	773774	774627	775480	776333	777186	778039	778892	779745	780598	781451	782304	783157	784010	784863	785716	786569	787422	788275	789128	790000	790853	791706	792559	793412	794265	795118	795971	796824	797677	798530	799383	800236	801089	801942	802795	803648	804501	805354	806207	807060	807913	808766	809619	810472	811325	812178	813031	813884	814737	815590	816443	817296	818149	819002	819855	820708	821561	822414	823267	824120	824973	825826	826679	827532	828385	829238	830091	830944	831797	832650	833503	834356	835209	836062	836915	837768	838621	839474	840327	841180	842033	842886	843739	844592	845445	846298	847151	848004	848857	849708	850561	851414	852267	853120	853973	854826	855679	856532	857385	858238	859091	859944	860797	861650	862503	863356	864209	865062	865915	866768	867621	868474	869327	870180	871033	871886	872739	873592	874445	875298	876151	877004	877857	878710	879563	880416	881269	882122	882975	883828	884681	885534	886387	887240	888093	888946	889799	890652	891505	892358	893211	894064	894917	895770	896623	897476	898329	899182	900035	900888	901741	902594	903447	904300	905153	906006	906859	907712	908565	909418	910271	911124	911977	912830	913683	914536	915389	916242	917095	917948	918801	919654	920507	921360	922213	923066	923919	924772	925625	926478	927331	928184	929037	929890	930743	931596	932449	933302	934155	935008	935861	936714	937567	938420	939273	940126	940979	941832	942685	943538	944391	945244	946097	946950	947803	948656	949509	950362	951215	952068	952921	953774	954627	9554
--	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	------

USEFUL HINTS.

The following are the recipes of body and white glaze:—
 White body—74 lb. china clay; 18 lb. flint; 17¼ lb. stone; 3½ lb. plaster. All must be mixed together dry, before adding water, on account of the plaster. Dip the brick at 30 oz. to the pint slop, and pass the body twice through a fine sieve. White Glaze—19 lb. felspar; 6 lb. stone; 1½ lb. whiting; ¾ lb. flint; ½ lb. plaster; 2½ lb. best flint glass; 12 oz. white lead. Mix as above.

Conrad Mischler writes to the *Painters' Magazine*: "I have been painting iron work for the last 18 years and find that by using Venetian red and brandon, thinned with raw linseed oil and japan, the article painted will stand the weather much better than when painted with any other. I painted two bridges some years ago which were not painted again until I did them after. One I painted with V. R. & B., as it is called, the other with red lead. The one painted with red lead was blistered and peeled to a great extent, while the other was in a very good condition. I painted them both over with V. R. & B., and they stand to-day looking almost as they did after being painted. Some ten years ago I painted the Fall River Railroad bridge with the V. R. & B. This bridge has iron beams in the water which I painted to low water mark, between tides. It has not been touched since, and has stood the wear of the water splendidly. I also painted an iron door with the same years ago, only giving it one coat. It is used every day by shop hands, and is clean and smooth to-day. I first clean the article thoroughly, and then use the V. R. & B. for the first coat, using for the next whatever color the party having the work done may desire. It has never failed to do everything expected of it, and has always given satisfaction. I have used red and white lead and experimented with all kinds of paint."

WEIGHT PER SQUARE FOOT OF SHEET IRON.—It will be interesting to those who have anything to do with sheet iron boiler plate or similar material to have an easily remembered rule for finding the weight per square foot of material they are working with. The *Ironmanger* says that it has been found by experience that a square foot of iron plate ⅛ inch thick weighed almost exactly five pounds, and this forms a basis for a very simple and easy rule. As a square foot of iron ⅛ inch thick weighs five pounds, a square foot of ¼ inch iron will weigh ten pounds, and we can say that the area of any sheet iron (or plate iron) in square feet multiplied by the thickness in one-eighths and multiplied by five will give the weight of the piece. There is a piece of tank iron 5-16 inch thick, 3 feet wide and five feet long, how much does it weigh? The area will be 3 feet by 5 feet, or 15 square feet. Now how many eighths is 5-16 of an inch? Since ⅛ = 2-16 and 2 is contained in 5 2½ times, we say 5-16 = 2½ eighths, or 2½ times five pounds = 12½ pounds per square foot, and as there are 16 square feet we have 15 by 12½ = 1,875. Where the thickness is even eighths of an inch, it is much simpler; but even this is not a hard thing to do as shown. If it is desired to use this rule for other than iron, we simply find the difference between the weights of the two metals per cubic inch and find what a square foot ⅛ inch thick will weigh, then work as shown above.

ZINC IN ARCHITECTURE.—Copper plating sheet zinc for building purposes has recently been tried abroad with considerable success, the process being especially recommended where mechanical wear takes place. The zinc combines very well with the copper. The galvanic method of copper plating is advantageously used, but the zinc may also be coated with copper by ordinary means. In the first place the sheet zinc is cleaned with soda from any adhering dirt or grease, and is also purified by a weak acid bath from the covering of zinc oxide. There are then dissolved in twenty-four parts of water one part of refined verdigris and twelve parts of tartar, being heated to boiling point, after which three or four pints of Spanish white are added. The Spanish white is here decomposed and is precipitated as lime tartrate. The dark blue liquid is poured off and filtered, and can be used either as a bath for the sheet zinc or for the production of copper-plating paste. The first mode of action is the more commendatory, as the fluid forces its way into the corners and angles of the zinc articles and is uniformly distributed all over. If it be desired to coat an immovable zinc object with copper, the article, after being cleaned, is painted with the copper solution and chalk compound, and, after drying, brushed. This very simple operation would likewise prove of value for architectural purposes where it is desired to remedy the generally unpleasing effect of zinc adornments.—*American Artizan*.

ENAMELLING SLATE BRICKS, &C.—Some five years ago, when first the manufacture of bricks and tiles from slate waste commenced to be made in North Wales, says the *British Clay Worker*, the white glazed brick was successfully produced by the following process and recipes:—The process is called the Biscuit-brick process—that is, the firing of the brick only slightly at first, all care being taken in setting and drawing the bricks so as not to damage them in any way. The bricks need to be fired at about half the customary heat for the first fire; they must then be taken to the dipping-house to be dipped in the body and glaze. Having everything in readiness, dip the part required to be glazed in clean water; you then pass on the brick to the next hand, whose dip will be the white body; then on to the next

hand whose dip will also be the white body; again, pass on the brick to the fourth hand, whose dip will be to the glaze. Allow the brick to dry a little; then take a knife and scrape off all body and glaze that may have run over the side of the brick. The brick can then be set in the kiln to be fired again. The slate waste, however, is a ticklish material and will not stand a hard fire. The heat it will take is a good red clay heat; it will thus be seen that a down-draft kiln will not do for glazing slate waste. It must be fired in a kiln where all the flash heat can be kept from the brick—the kiln generally used is the Simmer muffle-kiln. The kiln itself when set with bricks is almost a box-kiln. The bricks must be fired gently at first, and when on full fire it must not be neglected or allowed to sink too low. The firing should be continued until the glaze has run bright.

MANUFACTURES AND MATERIALS

QUALITY OF SHINGLES.

TOUCHING on the shingle question in a paper on "Ignorance Concerning Woods," read at the International Forestry Congress, Chicago, Mr. Saley said: There are builders who really believe that the old-fashioned white pine shingle is out of the race. Cypress, red cedar and red wood are in fact supplanting it, but not for the reason that they are driving from the markets a poor roofing material. This shingle controversy is really amusing. Manufacturers tear from old roofs the kinds of shingles in which they are interested and hold them up to illustrate how durable they are. The fact is that a shingle of any of the woods named, or even of a meaner wood, would keep our heads dry as long as it will be necessary to protect them from dampness. To make shingles last still longer, lower, as some would say, the grade of them. That may sound paradoxical, and I am not aware that the theory holds in any other line. "A good thick shingle" is a term often heard. My preference would be to cover a building with a good thin shingle. A shingle, as a rule, wears out instead of rotting out, and the thinner the butt over which the water runs and drops on the shingle below, the longer the shingle underneath will last. A steady dropping, it is said, will wear away a stone, and the shorter distance the water falls the longer the stone will last. This philosophy applies with great exactness to the durability of shingles.

THE Stanstead Granite Company has been incorporated.

A charter of incorporation has been granted to the Wright Cement Co., of Hull, Que.

The Danville Slate Co., of Danville, Que., will it is said seek a market among the school slate manufacturers in Germany.

The Rathbun Co. of Deseronto, lately purchased from Mr. E. B. Eddy, of Hull, machinery for the manufacture of patent lath and sheathing.

A train comprising fifteen cars loaded with British Columbia shingles was recently despatched from Vancouver over the C. P. R. to Eastern Canada.

Steps are being taken at Quebec to organize a company with a capital of \$100,000 to manufacture at St. Francois, pulp boards for interiors of buildings and furniture.

The Canadian exhibit of brick-making machinery at the World's Fair has attracted great attention and is constantly examined by United States and foreign experts.

A representative of the National Wall Paper Association of the United States, recently interviewed the Customs Department at Ottawa regarding the import tariff on wall paper.

The St. Johns Stone Chinaware Co., whose works at St. Johns, Que., were destroyed by fire some months ago, express their intention of rebuilding on the same site provided the town will grant them a bonus of \$25,000.

The Rosedale Pressed Brick and Terra Cotta Co. has lately been organized in Toronto. The Company have leased a deposit of clay 27 acres in extent on the banks of the Don, and have erected buildings thereon. The necessary plant has been ordered, and manufacturing will shortly be commenced. Mr. John Flett is President of the Company, and Mr. J. V. Wright, Managing Director.

Artificially stained bricks of a rich chocolate color, and others made from clay mixed with soot, have been sometimes sold as black for ornamenting walls with diapers, chequers and strings. The latter description are very inferior, while surface-washed imitations weather indifferently. The *British Clay Worker* states that a little manganese and much iron in clay raised to an intense heat will produce bricks of no fleeting blackness.

Messrs. McRae & Co., of Ottawa, have secured control for Canada, of a German patent for seasoning and staining beech and birch woods. By the new process the sap is sweated out of the boards by being placed, in a green state, in steam chambers for twelve days, and subsequently for three days in a drying chamber. The wood is then by a chemical application stained a rich walnut color. Beech and birch thus treated have met with a favorable reception in the European market, to which part of the product of the Canadian kilns will be exported.